PATENT ABSTRACTS OF JAPAN

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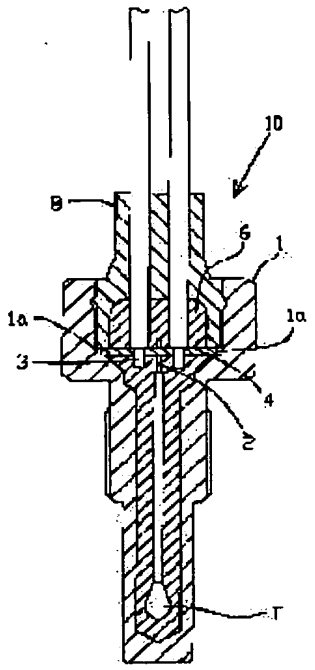
(54) TEMPERATURE SENSOR

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a temperature sensor having a structure in which a lead wire and a wire for the outside can be connected simply and in which the efficiency of an operation can be increased and to provide a temperature sensor having a structure in which a laterally placed insulating plate can be positioned surely and in which a sealing resin is filled easily down to the lower part inside a housing.

SOLUTION: A temperature sensor has a structure in which a thermistor T is installed inside a housing 1 and in which the lead wire 2 of the thermistor T and a wire 3 communicating with the outside are connected inside the housing by using an insulating plate 4. In the temperature sensor, the insulating plate 4 is provided with a hole 4a for a lead wire and a hole 4b for a wire. The hole 4a for the lead wire and the hole 4b for the wire are connected by a conductor 9. The lead wire 2 is connected to the hole 4a for the lead wire. The wire 3 is connected to the hole 4b for the wire. In the temperature sensor, a holding part 1b which can hold the insulating plate 4 transversely is formed inside the housing 1. The insulating plate 4 is placed on the holding part, and a space part 11 which is used to pour a sealing resin 6 into the lower part inside the housing is provided between the housing 1 and the insulating plate 4.



LEGAL STATUS

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CLAIMS

[Claim(s)]
[Claim 1] In the temperature sensor of structure which connects the electric wire which installs a thermistor in housing and stands in a row in the lead wire and the exterior of said thermistor within said housing using an electric insulating plate said electric insulating plate It is the temperature sensor characterized by having connected the hole for said lead wire, and the hole for said electric wires with the conductor while having the hole for said lead wire, and the hole for said electric wires, respectively, having connected lead wire to the hole further for said lead wire, and connecting an electric wire to the hole for said electric wires, respectively.
[Claim 2] The temperature sensor according to claim 1 characterized by forming in housing the step which can be arranged sideways to the hole of housing for said electric insulating plate, laying said electric insulating plate in the step concerned, pressing the upper part of said electric insulating plate with a grommet further, and positioning the electric insulating plate concerned.
[Claim 3] It is the temperature sensor according to claim 2 characterized by said electric insulating plate having the space section for slushing closure resin down [in housing] at said grommet list.
[Claim 4] In the temperature sensor of structure which connects the electric wire which installs a thermistor in housing and stands in a row in the lead wire and the exterior of said thermistor within said housing using an electric insulating plate In housing, the attaching part which can be arranged sideways is formed for said electric insulating plate to the hole of housing, and said electric insulating plate is laid in the attaching part concerned. Further between said housing and said electric insulating plates The temperature sensor characterized by having the space section for slushing closure resin down [in housing].

[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention installs a thermistor in housing and relates to the temperature sensor of structure which connects the electric wire which stands in a row in the lead wire and the exterior of a thermistor within said housing using an electric insulating plate.
[0002]
[Description of the Prior Art] Conventionally, it is known that this kind of temperature sensor is the temperature sensor 50 of structure which connects the electric wire 53 which installs Thermistor T in housing 51 and stands in a row in the lead wire 52 and the exterior of Thermistor T within housing 51 using an electric insulating plate 54 as shown in drawing 7 and drawing 8 .
[0003] The thermistor unit equipped these holes with the metal member 55 of the shape of a ring called "eye a pigeon", inserted further the edge of the electric wire 53 which stands in a row in lead wire 52 and the exterior to these metal members 55, soldered these lead wire 52 and an electric wire 53, and has connected while it forms a hole in two upper and lower sides of the longwise-like electric insulating plate 54, as shown in drawing 9 and drawing 10 .
[0004] Moreover, up 54a is formed broadly and the electric insulating plate 54 of said thermistor unit provides step 54b of a slanting configuration in the both-sides soffit of this up 54a, as shown in drawing 10 .

[0005] On the other hand, if housing 51 is equipped with section 51with stage a which lays step 54b of said electric insulating plate 54 and equips housing 51 with said thermistor unit as shown in drawing 11 , step 54b of an electric insulating plate 54 is laid in this section 51with stage a, and positioning of a thermistor unit is made.
[0006] After equipping with a thermistor unit in housing 51, it was filled up with resin 56, the resin seal was performed, and the upper part is equipped with the grommet 58.
[0007]
[Problem(s) to be Solved by the Invention] In the conventional temperature sensor 50, as mentioned above, equip the hole of two upper and lower sides of an electric insulating plate 54 with the ring-like metal member 55, and the edge of the electric wire 53 which stands in a row in lead wire 52 and the exterior to these metal members 55 is inserted. setting to one hole in all two music wooden-clogs lines by which directivity differs like lead wire 52 and an electric wire 53, although these lead wire 52 and an electric wire 53 were soldered and it has connected had a problem in respect of workability, and it had further the inconvenience of being easy to separate from a line at the time of soldering.
[0008] Moreover, although the step 54b is laid in section 51with stage a of housing 51 and positioning of a thermistor unit is made as mentioned above, the longwise-like electric insulating plate 54 Since it was not regulated at all in the direction in which an electric insulating plate 54 is lifted, when an electric insulating plate 54 was set shallowly, there was also inconvenience which becomes inadequate [the embedding depth by the resin for closure], consequently serves as poor insulation by encroachment of water.
[0009] This invention was made in view of the above-mentioned situation, carries out an electric insulating plate every width fundamentally, makes simple connection of lead wire and the electric wire for the exteriors, and aims at obtaining the temperature sensor of the structure where working efficiency is raised.
[0010] Furthermore, the electric insulating plate of every width is positioned certainly, and this invention aims at obtaining the temperature sensor of the structure where even the lower part in housing is easily filled up with the resin for closure.
[0011]

[Means for Solving the Problem] In the temperature sensor of structure which connects the electric wire which invention indicated to the 1st claim of this application installs a thermistor in housing, and stands in a row in the lead wire and the exterior of said thermistor within said housing using an electric insulating plate While said electric insulating plate is equipped with the hole for said lead wire, and the hole for said electric wires, respectively, the hole for said lead wire and the hole for said electric wires are the temperature sensors with which it was connected with the conductor, and lead wire was connected to the hole further for said lead wire, and they connected the electric wire to the hole for said electric wires, respectively.
[0012] Thus, since lead wire is connected to the hole for lead wire and an electric wire is connected to the hole for electric wires, respectively, since it can set to the hole according to individual, each line is connectable reasonable. Therefore, since it does not require setting two lines to one hole like before, it is hard to separate at the time of soldering, therefore workability can be raised.
[0013] Furthermore, since each hole is connected with the conductor while an electric insulating plate is equipped with the hole for lead wire, and the hole for electric wires, respectively, each line is set to the hole according to individual, it only solders to the hole concerned, and lead wire and an electric wire can be connected, therefore workability can be raised also at this point.
[0014] Invention indicated to the 2nd claim of this application is the temperature sensor of a configuration of forming in housing the step which can be arranged sideways to the hole of housing for said electric insulating plate, laying said electric insulating plate in the step concerned, pressing the upper part of said electric insulating plate with a grommet further, and positioning the electric insulating plate concerned in invention of claim 1.
[0015] Thus, if constituted, since an electric insulating plate will be pinched between the step of housing, and a grommet, therefore the immobilization in the vertical direction will be made, inconvenience which an electric insulating plate is lifted like before, and it is not set shallowly, consequently the embedding depth by the resin for closure serves as imperfection, and serves as poor insulation by encroachment of water is avoidable.
[0016] Invention indicated to the 3rd claim of this application is the temperature sensor of a configuration of having the space section for said electric insulating plate slushing closure resin down [in housing] in said grommet list in invention of claim 2.
[0017] Thus, if it has the space section for slushing closure resin into a grommet and an electric insulating plate down [in housing] It will fill up with resin uniformly upwards from the lower part in housing through the space section. Therefore, the inconvenience which a thermistor, an electric insulating plate, and each line fully bury, are hardened by resin, serves as structure by which an air pocket cannot especially be easily made in housing between a grommet and an electric insulating plate, and serves as poor insulation by encroachment of water is beforehand avoidable.
[0018] In the temperature sensor of structure which connects the electric wire which invention indicated to the 4th claim of this application installs a thermistor in housing, and stands in a row in the lead wire and the exterior of said thermistor within said housing using an electric insulating plate It is the temperature sensor which forms in housing the attaching part which can be arranged sideways to the hole of housing for said electric insulating plate, lays said electric insulating plate in the attaching part concerned, and has the space section for slushing closure resin down [in housing] between said housing and said electric insulating plates further.
[0019] Therefore, the inconvenience which it will fill up with resin uniformly upwards from the lower part in housing through the space section, and each part is fully buried, is hardened by resin like said claim 3, serves as structure by which an air pocket cannot be made easily in housing, and serves as poor insulation by encroachment of water is beforehand avoidable.
[0020] Furthermore, since the attaching part which can be arranged sideways is formed for an electric insulating plate to the hole of housing in housing and an electric insulating plate is laid in the attaching part concerned, an electric insulating plate can omit the grommet with which the upper part of an electric insulating plate is usually equipped, and can attain laborsaving of components mark while being held at this attaching part, consequently positioning the electric insulating plate of every width certainly.
[0021]
[Embodiment of the Invention] Below, the example of this invention is explained at a detail based on a drawing.
[0022] Drawing 1 and drawing 2 show the 1st example of the temperature sensor concerning this invention, and like the conventional example, the temperature sensor 10 of this example installs Thermistor T in housing 1, and connects the electric wire 3 which stands in a row in the lead wire 2 and the exterior of

Thermistor T within housing 1 using an electric insulating plate 4.
[0023] In housing 1, step 1a which can be arranged sideways is formed for the electric insulating plate 4 to the hole of housing. Furthermore, the upper part of said electric insulating plate 4 inserts a grommet 8, an electric insulating plate 4 is pressed with this grommet 8, and positioning of an electric insulating plate 4 is performed.
[0024] As shown in drawing 3 , while an electric insulating plate 4 is equipped with hole 4b for hole 4a and the electric wires for lead wire, hole 4b for hole 4a and the electric wires for lead wire is connected with the conductor 9. In this example, 2 sets of hole 4b for hole 4a and the electric wires for lead wire is formed, therefore two conductors 9 are also used.
[0025] And lead wire 2 is connected to hole 4a for said lead wire, and the electric wire 3 is connected to hole 4b for said electric wires, respectively. Therefore, each lead wire 2 and an electric wire 3 are set to each holes 4a and 4b, it only solders to the hole concerned, and lead wire 2 and an electric wire 3 are connected.
[0026] Moreover, the electric insulating plate 4 is drilling two through-holes 4c and 4c at least for ** in the part, as shown in drawing 3 . These through-holes 4c and 4c constitute the space section for slushing closure resin down [in housing].
[0027] Similarly, as shown in drawing 4 , the grommet 8 provides the space sections 8a and 8a for slushing closure resin for a part down [in notching **** and housing].
[0028] And it equips with a thermistor unit (Thermistor T, lead wire 2, an electric insulating plate 4, electric wire 3) in housing 1, an electric insulating plate 4 is laid in step 1a of housing 1, and it arranges sideways to the hole of housing, and further, a grommet 8 is inserted in the upper part of an electric insulating plate 4, an electric insulating plate 4 is pressed with this grommet 8, an electric insulating plate 4 is positioned, it is filled up with resin 6 and a resin seal is performed after that. At this time, resin 6 passes along the space section slack through-holes 4c and 4c of the space sections 8a and 8a of a grommet 8, and an electric insulating plate 4, and is fully slushed down [in housing].
[0029] Since lead wire 2 is connected to hole 4a for lead wire and it connects an electric wire 3 to hole 4b for electric wires, respectively, since it can set to the hole according to individual, the temperature sensor 10 of this example mentioned above can connect each line reasonable. Therefore, since it does not require setting two lines to one hole like before, it is hard to separate at the time of soldering, therefore workability can be raised.
[0030] Furthermore, since each hole is connected with the conductor 9 while having hole 4b for hole 4a and the electric wires for the lead wire mentioned above, respectively, an electric insulating plate 4 sets each lines 2 and 3 to the hole according to individual, only solders them to the hole concerned, and can connect lead wire 2 and an electric wire 3, therefore can raise workability also at this point.
[0031] Moreover, since it has the space sections 8a and 4c for slushing closure resin into a grommet 8 and an electric insulating plate 4 down [in housing] in this example It will fill up with resin 6 uniformly upwards from the lower part in housing through the space section. Therefore, the inconvenience which Thermistor T, an electric insulating plate 4, and each lines 2 and 3 fully bury, are hardened by resin 6, serves as structure by which an air pocket cannot especially be easily made in housing between a grommet 8 and an electric insulating plate 4, and serves as poor insulation by encroachment of water is beforehand avoidable.
[0032] Drawing 5 and drawing 6 show other examples of this invention, and also in this example, Thermistor T is installed in housing 1, and they are premised on the temperature sensor 10 of structure which connects the electric wire 3 which stands in a row in the lead wire 2 and the exterior of said thermistor T within said housing using an electric insulating plate 4 for it.
[0033] In this example, attaching part 1b which can be arranged sideways is formed for an electric insulating plate 4 to the hole of housing 1 in housing 1, an electric insulating plate 4 is laid in the attaching part 1b concerned, and it has the space sections 11 and 11 for slushing closure resin down [in housing] between housing 1 and an electric insulating plate 4 further.
[0034] Attaching part 1b formed in housing 1 is constituted from a lower round hole and a upside abbreviation rectangular-head hole by the groove, and inserts in the angle of the square-like electric insulating plate 4 according to the corner of a upside abbreviation rectangular-head hole, rotates an electric insulating plate 4 a little, performs the omission stop of this electric insulating plate 4, and fills up with and carries out resin hammer hardening of the resin after that.
[0035] In addition, 12 are the protective cover of an electric wire 3 among drawing.
[0036] According to the temperature sensor 10 of this example, like a precedent, it will fill up with resin 6 uniformly upwards from the lower part in housing 1 through those space sections 11 and 11, it fully buries each part by resin 6, and is hardened, and it becomes the structure by which an air pocket cannot be made

easily in housing. Therefore, the inconvenience which serves as poor insulation by encroachment of water is beforehand avoidable.
[0037] Furthermore, since attaching part 1b which can be arranged sideways is formed for an electric insulating plate 4 to the hole of housing in housing 1 and an electric insulating plate 4 is laid in the attaching part 1b concerned While being held at this attaching part 1b, consequently positioning the electric insulating plate 4 of every width certainly, an electric insulating plate 4 can omit the grommet 8 with which the upper part of an electric insulating plate 4 is equipped, and can attain laborsaving of components mark.
[0038]
[Effect of the Invention] As explained above, invention indicated to the 1st claim of this application In the temperature sensor of structure which connects the electric wire which installs a thermistor in housing and stands in a row in the lead wire and the exterior of said thermistor within said housing using an electric insulating plate said electric insulating plate While having a hole for said lead wire, and a hole for said electric wires, respectively, the hole for said lead wire and the hole for said electric wires are the temperature sensors with which it was connected with the conductor, and lead wire was connected to the hole further for said lead wire, and they connected the electric wire to the hole for said electric wires, respectively.
[0039] Thus, since lead wire is connected to the hole for lead wire and an electric wire is connected to the hole for electric wires, respectively, since it can set to the hole according to individual, each line is connectable reasonable. Therefore, since it does not require setting two lines to one hole like before, it is hard to separate at the time of soldering, therefore workability can be raised.
[0040] Furthermore, since each hole is connected with the conductor while an electric insulating plate is equipped with the hole for lead wire, and the hole for electric wires, respectively, each line is set to the hole according to individual, it only solders to the hole concerned, and lead wire and an electric wire can be connected, therefore workability can be raised also at this point.
[0041] Invention indicated to the 2nd claim of this application is the temperature sensor of a configuration of forming in housing the step which can be arranged sideways to the hole of housing for said electric insulating plate, laying said electric insulating plate in the step concerned, pressing the upper part of said electric insulating plate with a grommet further, and positioning the electric insulating plate concerned in invention of claim 1.
[0042] Thus, if constituted, since an electric insulating plate will be pinched between the step of housing, and a grommet, therefore the immobilization in the vertical direction will be made, inconvenience which an electric insulating plate is lifted like before, and it is not set shallowly, consequently the embedding depth by the resin for closure serves as imperfection, and serves as poor insulation by encroachment of water is avoidable.
[0043] Invention indicated to the 3rd claim of this application is the temperature sensor of a configuration of having the space section for said electric insulating plate slushing closure resin down [in housing] in said grommet list in invention of claim 2.
[0044] Thus, if it has the space section for slushing closure resin into a grommet and an electric insulating plate down [in housing] It will fill up with resin uniformly upwards from the lower part in housing through the space section. Therefore, the inconvenience which a thermistor, an electric insulating plate, and each line fully bury, are hardened by resin, serves as structure by which an air pocket cannot especially be easily made in housing between a grommet and an electric insulating plate, and serves as poor insulation by encroachment of water is beforehand avoidable.
[0045] In the temperature sensor of structure which connects the electric wire which invention indicated to the 4th claim of this application installs a thermistor in housing, and stands in a row in the lead wire and the exterior of said thermistor within said housing using an electric insulating plate It is the temperature sensor which forms in housing the attaching part which can be arranged sideways to the hole of housing for said electric insulating plate, lays said electric insulating plate in the attaching part concerned, and has the space section for slushing closure resin down [in housing] between said housing and said electric insulating plates further.
[0046] Therefore, the inconvenience which it will fill up with resin uniformly upwards from the lower part in housing through the space section, and each part is fully buried, is hardened by resin like said claim 3, serves as structure by which an air pocket cannot be made easily in housing, and serves as poor insulation by encroachment of water is beforehand avoidable.
[0047] Furthermore, since the attaching part which can be arranged sideways is formed for an electric insulating plate to the hole of housing in housing and an electric insulating plate is laid in the attaching part

concerned, an electric insulating plate can omit the grommet with which the upper part of an electric insulating plate is usually equipped, and can attain laborsaving of components mark while being held at this attaching part, consequently positioning the electric insulating plate of every width certainly.
[0048] Thus, according to this invention, connection of lead wire and the electric wire for the exteriors is made simple, the temperature sensor of the structure where working efficiency is raised, and the electric insulating plate of every width are positioned certainly, and the temperature sensor of the structure where even the lower part in housing is easily filled up with the resin for closure can be obtained.

[Translation done.]

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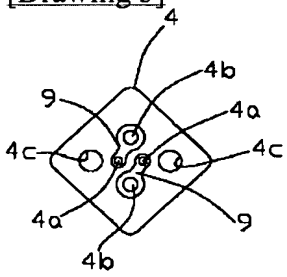
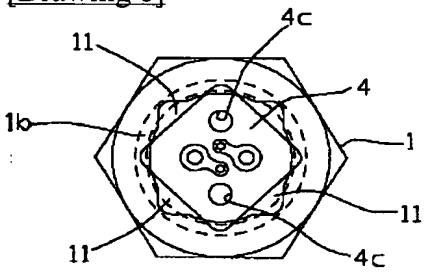
DRAWINGS

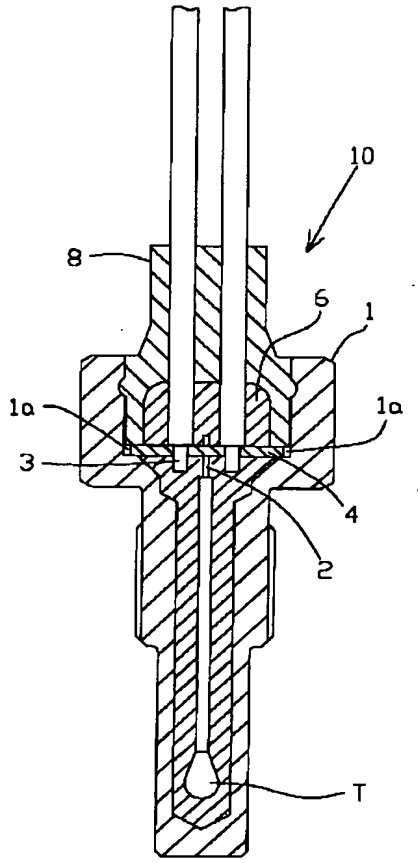
[Drawing 3]



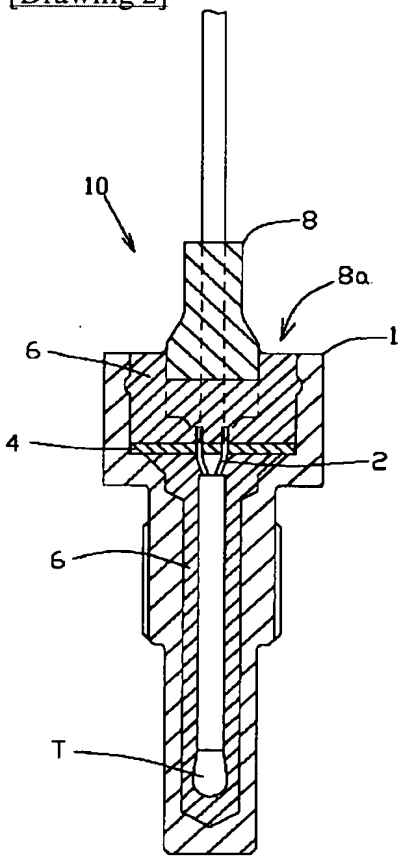
[Drawing 6]



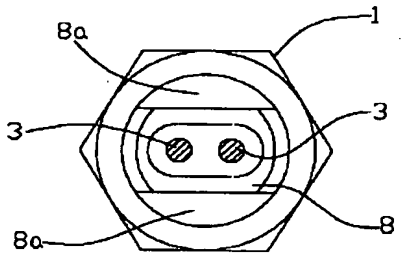
[Drawing 1]



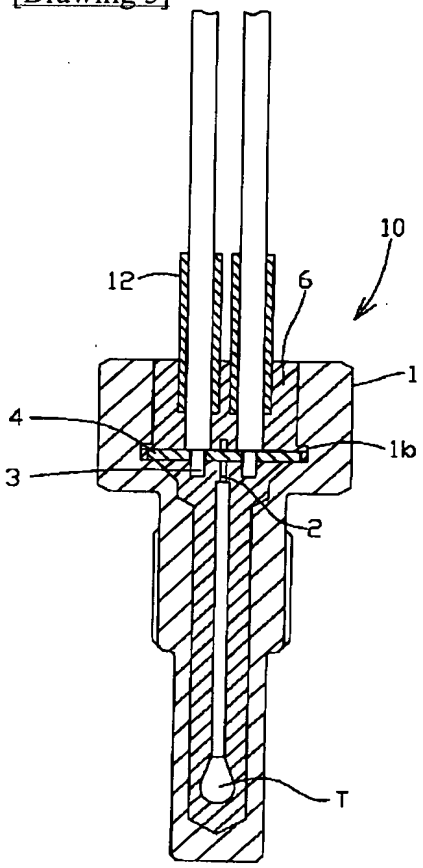
[Drawing 2]



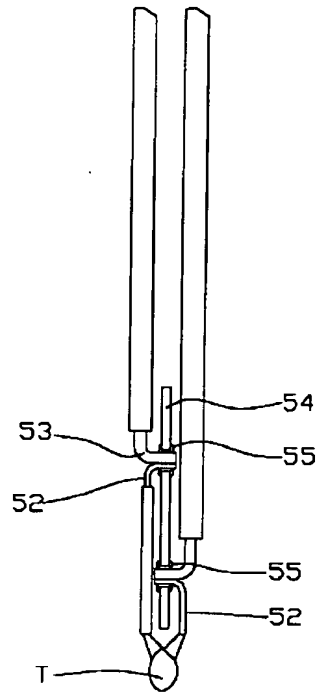
[Drawing 4]



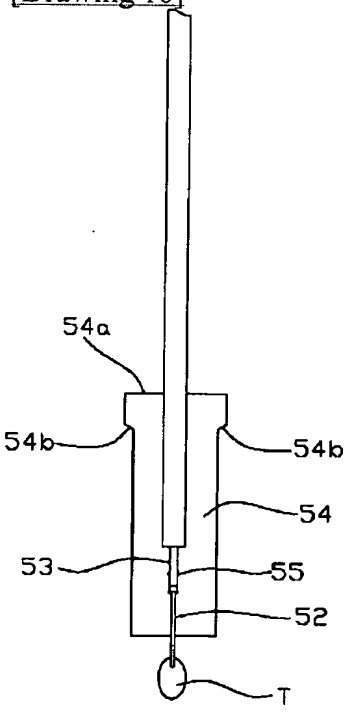
[Drawing 5]



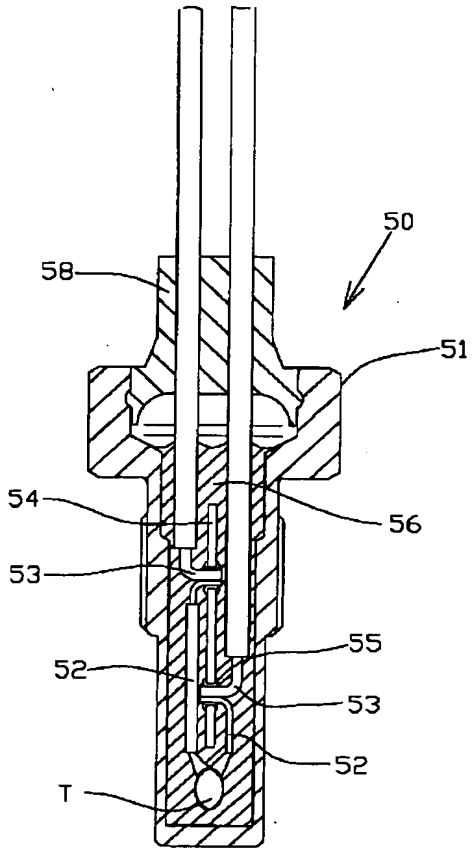
[Drawing 9]



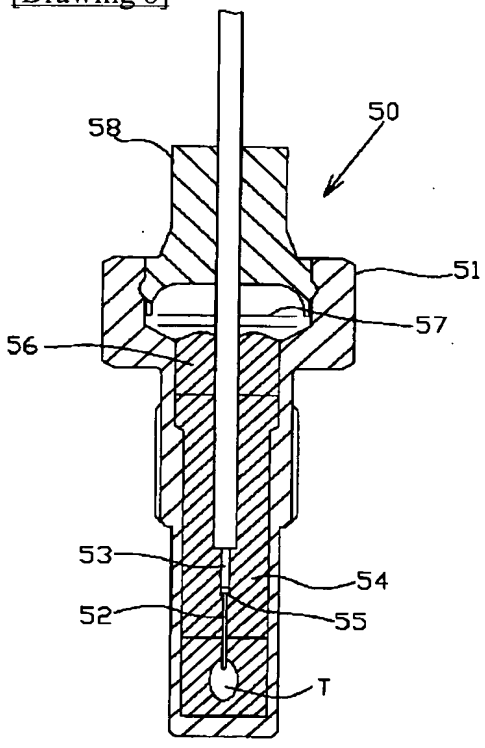
[Drawing 10]



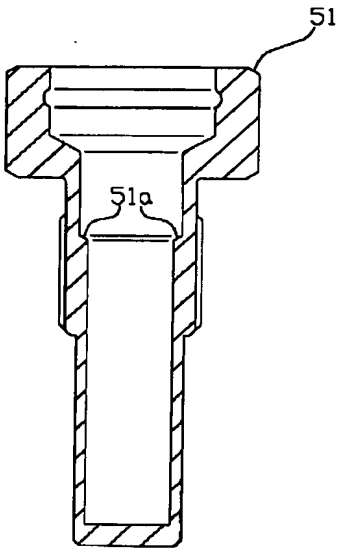
[Drawing 7]



[Drawing 8]



[Drawing 11]



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